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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/782,365	02/19/2004	Hsin-Ching Shih	TS02-181	4188
42717	7590	05/18/2005	EXAMINER	
HAYNES AND BOONE, LLP 901 MAIN STREET, SUITE 3100 DALLAS, TX 75202			VU, QUANG D	
			ART UNIT	PAPER NUMBER

2811

DATE MAILED: 05/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/782,365

Applicant(s)

SHIH ET AL.

Examiner

Quang D. Vu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 27-52 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 27-52 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 04/15/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election with traverse of group II in the reply filed on 12/02/04 is acknowledged. The traversal is on the ground(s) that the restriction is not proper. This is not found persuasive because group I (claims 1-26) and group II (claims 27-52) are related as process of making and product made, respectively. Additionally, the device of group II (claims 27-52) invention could be made by as a materially different process. For example, selectively forming a layer of dielectric over the substrate first device features having a width dimension concurrent with second device features having a diameter dimension, instead of patterning in a layer of dielectric deposited over the substrate first device features having a width dimension concurrent with patterning second device features having a diameter dimension.

The requirement is still deemed proper and is therefore made FINAL.

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 27-29, 33 and 34 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 6,498,089 to Komada.

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Regarding claim 27, Komada (figures 1A-B) teaches the structure of a seal ring over a semiconductor device, comprising:

a substrate, the substrate having been provided with semiconductor devices (column 4, lines 38-44);

in a layer of dielectric (23) deposited over the substrate, a pattern of first device (a portion of [25r]) features having a width dimension and a pattern of second device (a portion of [25c]) features having a diameter dimension, the width dimension (width of the [25r]) being smaller than the diameter dimension (dimension of the [25c]).

Regarding claim 28, Komada teaches the first device (a portion of [25r]) features comprising a device seal ring.

Regarding claim 29, Komada teaches the second device (a portion of [25c]) features comprising via openings.

Regarding claim 33, Komada (figures 1A-B) teaches a structure of a seal ring over semiconductor device, comprising:

a substrate, the substrate having been provided with semiconductor devices (column 4, lines 38-44); and

a seal ring having a width dimension (a portion of [25r]) and via openings (portion of [25c]) having a diameter dimension having been patterned in a layer of dielectric (23) deposited over the substrate, the width dimension (a portion of [25r]) and the diameter dimension (a portion of [25c]) being mutually dependent (diameter dimension of [25c] is larger than the width dimension of [25r]).

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Regarding claim 34, Komada teaches the width dimensions (portion of [25r]) being smaller than the diameter dimensions (portion of [25c]).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 30 and 38-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 6,498,089 to Komada in view of US Patent No. 6,635,567 to Ebertseder et al.

Regarding claim 30, Komada differs from the claimed invention by not showing the second device features comprising at least one Alignment Mark. However, Ebertseder et al. (figures 1-2) teach the alignment mark (5). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teaching of Ebertseder et al. into the device taught by Komada in order improve the accuracy of the alignment of the opening hole.

Regarding claim 38, Komada (figures 1A-b) teaches a structure of a seal ring over a semiconductor device, comprising:

a substrate, the substrate having been provided with semiconductor devices (column 4, lines 38-44); and

a seal ring having a first Critical Dimension (a portion of [25r]) and a second Critical Dimension (a portion of [25c]) having been patterned in a layer of dielectric (23) deposited over

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the substrate, the first Critical Dimension (portion of [25r]) and the second Critical Dimension (portion of [25c]) being mutually dependent (diameter dimension of [25c] is larger than of the width dimension of [25r]).

Komada differs from the claimed invention by not showing Alignment Mark in a second Critical Dimension. However, Ebertseder et al. (figures 1-2) teach the alignment mark (5). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teaching of Ebertseder et al. into the device taught by Komada in order to improve the accuracy of the alignment of the opening hole.

Regarding claim 39, the combined device shows the first Critical Dimension (Komada; portion of [25r]) being smaller than the second Critical Dimension (Komada; portion of [25c]).

Regarding claim 40, Komada differs from the claimed invention by not showing the first Critical Dimension being about 0.15 micrometer. It would have been obvious to one having ordinary skill in the art at the time the invention was made for the first Critical Dimension being about 0.15 micrometer in order to provide better isolation between the devices. Furthermore, it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 41, Komada differs from the claimed invention by not showing the second Critical Dimension being about 0.20 micrometer. It would have been obvious to one having ordinary skill in the art at the time the invention was made for the second Critical Dimension being about 0.20 micrometer in order to provide better contact between the devices. Furthermore, it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

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Regarding claim 42, Komada (figures 1A-B) teaches a structure of a seal ring over a semiconductor device, comprising:

providing a substrate, the substrate having been provided with semiconductor devices (column 4, lines 38-44); and

concurrently patterning a seal ring having a first Critical Dimension (a portion of [25r]) and a second Critical Dimension (a portion of [25c]) in a layer of dielectric (23) deposited over the substrate, the first Critical Dimension (portion of [25r]) being smaller than the second Critical Dimension (portion of [25c]).

Komada differs from the claimed invention by not showing Alignment Mark in a second Critical Dimension. However, Ebertseder et al. (figures 1-2) teach the alignment mark (5). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teaching of Ebertseder et al. into the device taught by Komada in order improve the accuracy of the alignment of the opening hole.

Regarding claim 43, Komada differs from the claimed invention by not showing the first Critical Dimension being about 0.15 micrometer. It would have been obvious to one having ordinary skill in the art at the time the invention was made for the first Critical Dimension being about 0.15 micrometer in order to provide better isolation between the devices. Furthermore, it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 44, Komada differs from the claimed invention by not showing the second Critical Dimension being about 0.20 micrometer. It would have been obvious to one having ordinary skill in the art at the time the invention was made for the second Critical

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Dimension being about 0.20 micrometer in order to provide better contact between the devices. Furthermore, it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 45, Komada (figures 1A-B) teaches a structure of a seal ring over a semiconductor device comprising:

a substrate, the substrate having been provided with semiconductor devices(column 4, lines 38-44); and

a seal ring having a first Critical Dimension (a portion of [25r]) and at least one via opening having a second Critical Dimension (a portion of [25c]) and at least one via opening having a third Critical Dimension (a another portion of [25c]) having been patterned in a layer of dielectric (23) deposited over the substrate, the first Critical Dimension and the second Critical Dimension and the third Critical Dimension being mutually dependent (the width dimension of [25r] of the first Critical Dimension is smaller than the diameter dimension of [25c] of the second and the third Critical Dimension).

Komada differs from the claimed invention by not showing Alignment Mark in a third Critical Dimension. However, Ebertseder et al. (figures 1-2) teach the alignment mark (5). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teaching of Ebertseder et al. into the device taught by Komada in order improve the accuracy of the alignment of the opening hole.

Regarding claim 46, the combined device shows the first Critical Dimension (Komada; the width dimension of [25r]) being smaller than the second Critical Dimension and the third Critical Dimension (Komada; the diameter dimension of [25c]).



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Regarding claim 47, Komada differs from the claimed invention by not showing the first Critical Dimension being about 0.15 micrometer. It would have been obvious to one having ordinary skill in the art at the time the invention was made for the first Critical Dimension being about 0.15 micrometer in order to provide better isolation between the devices. Furthermore, it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 48, Komada differs from the claimed invention by not showing the second Critical Dimension being about 0.20 micrometer. It would have been obvious to one having ordinary skill in the art at the time the invention was made for the second Critical Dimension being about 0.20 micrometer in order to provide better contact between the devices. Furthermore, it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 49, Komada differs from the claimed invention by not showing the third Critical Dimension being about 0.20 micrometer. It would have been obvious to one having ordinary skill in the art at the time the invention was made for the third Critical Dimension being about 0.20 micrometer in order to provide better contact between the devices. Furthermore, it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 50, Komada (figures 1A-B) teaches a structure of a seal ring over a semiconductor device comprising:

a substrate, the substrate having been provided with semiconductor devices(column 4, lines 38-44); and

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a seal ring having a first Critical Dimension (a portion of [25r]) and at least one via opening having a second Critical Dimension (a portion of [25c]) and at least one via opening having a third Critical Dimension (a another portion of [25c]) having been patterned in a layer of dielectric (23) deposited over the substrate, the first Critical Dimension (the width dimension of [25r]) being smaller than the second Critical Dimension (the diameter dimension of [25c]) and the third Critical Dimension (a another portion of [25c]).

Komada differs from the claimed invention by not showing Alignment Mark in a third Critical Dimension. However, Ebertseder et al. (figures 1-2) teach the alignment mark (5). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teaching of Ebertseder et al. into the device taught by Komada in order improve the accuracy of the alignment of the opening hole.

Regarding claim 51, Komada differs from the claimed invention by not showing the first Critical Dimension being about 0.15 micrometer. It would have been obvious to one having ordinary skill in the art at the time the invention was made for the first Critical Dimension being about 0.15 micrometer in order to provide better isolation between the devices. Furthermore, it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 52, Komada differs from the claimed invention by not showing the second Critical Dimension being about 0.20 micrometer. It would have been obvious to one having ordinary skill in the art at the time the invention was made for the second Critical Dimension being about 0.20 micrometer in order to provide better contact between the devices.

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Furthermore, it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

5. Claims 31, 32, 35, 36 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 6,498,089 to Komada.

Regarding claim 31, Komada differs from the claimed invention by not showing the width dimension being about 0.15 micrometer. It would have been obvious to one having ordinary skill in the art at the time the invention was made for the width dimension being about 0.15 micrometer in order to provide better isolation between the devices. Furthermore, it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 32, Komada differs from the claimed invention by not showing the diameter dimension being about 0.20 micrometer. It would have been obvious to one having ordinary skill in the art at the time the invention was made for the diameter dimension being about 0.20 micrometer in order to provide better contact between the devices. Furthermore, it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 35, Komada differs from the claimed invention by not showing the width dimension being about 0.15 micrometer. It would have been obvious to one having ordinary skill in the art at the time the invention was made for the width dimension being about 0.15 micrometer in order to provide better isolation between the devices. Furthermore, it has been

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held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 36, Komada differs from the claimed invention by not showing the diameter dimension being about 0.20 micrometer. It would have been obvious to one having ordinary skill in the art at the time the invention was made for the diameter dimension being about 0.20 micrometer in order to provide better contact between the devices. Furthermore, it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 37, Komada (figures 1A-B) teaches a structure of a seal ring over semiconductor device, comprising:

a substrate, the substrate having been provided with semiconductor devices (column 4, lines 38-44); and

a seal ring having a width dimension (a portion of [25r]) and via openings (portion of 25c]) having a diameter dimension having been patterned in a layer of dielectric (23) deposited over the substrate.

Komada differs from the claimed invention by not showing the width dimension being about 0.15 micrometer. It would have been obvious to one having ordinary skill in the art at the time the invention was made for the width dimension being about 0.15 micrometer in order to provide better isolation between the devices. Furthermore, it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

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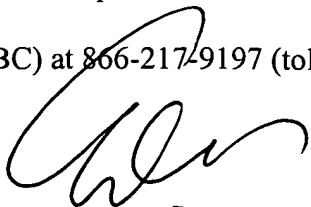
Komada further differs from the claimed invention by not showing the diameter dimension being about 0.20 micrometer. It would have been obvious to one having ordinary skill in the art at the time the invention was made for the diameter dimension being about 0.20 micrometer in order to provide better contact between the devices. Furthermore, it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quang D. Vu whose telephone number is 571-272-1667. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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qv

May 13, 2005